WESTMINSTER BRIDGE.

To the report which we inserted in our last number, we add Mr. Barry's reply and report, as under:—

"TO THE EDITOR OF THE 'TIMES.'

"SIR,—As, in the statement respecting Westminster-bridge, inserted in your paper of Tuesday last, you have appended a report from Messrs. Walker and Burges to the Speaker of the House of Commons, animadverting upon the suggestions which I ventured to offer in a report to the Commissioners for the encouragement of the Fine Arts, relative to the propriety of rebuilding the superstructure of that bridge, I trust you will do me the justice to publish the subjoined letter, which I addressed to the Speaker in consequence.

"It may be proper to observe, that since those communications were made to the Speaker, it has become notorious that the system pursued by Messrs. Walker and Burges for securing the foundation of the piers has failed, and the bridge in consequently in such a critical state as to cause an order to be given by the Commissioners to suspend all further works for the present. From what I have seen of the recent alarming dislocations of the present structure, it is now, in my opinion, no longer a question as to the propriety of rebuilding the superstructure alone, but the entire bridge.

"Your early insertion of this communication will oblige, Sir, your obedient servant,

"CHARLES BARRY."

"Great George-street, Westminster,
Dec. 28."

LETTER FROM MR. BARRY TO THE SPEAKER, IN ANSWER TO A REPORT OF MESSRS. WALKER AND BURGES UPON THE PROPOSED ALTERATIONS.

32, Great George street, July 10, 1843.

SIR,—As Messrs. Walker and Burges have thought proper to print and publish a letter, addressed to you as chairman of the Commissioners of Westminster-bridge, relative to the suggestions I ventured to offer for the improvement in that bridge, in a report which I made to the Fine Arts Commissioners, of the 22nd of February last, I feel called upon to address to you a few observations, for the information of the board over which you preside, chiefly with the view of removing several misconstructions which that letter is calculated to occasion.

Westminster-bridge has long been considered extremely inconvenient, as well as unsightly, and, from its proximity to the new Houses of Parliament, is generally felt to have a most injurious effect upon the appearance of that building. As a remedy for these defects, the main objects to be attained are obviously to lower the roadway, to increase the waterway and head-room under the arches, and to reduce the mass of the bridge to the greatest practicable extent. In order to accomplish these objects in the most effectual manner, it appears to me to be necessary to re-build the bridge; but as the Commissioners were incurring a large outlay in securing and extending the foundations, I recommended in my report above alluded to that the re-building should be confined to the superstructure.

Previously to noticing the several points of Messrs. Walker and Burges's letter, I would beg to observe that the suggestions contained in my report were offered merely as hints for the consideration of the Fine Arts Commissioners, and not as mature opinions founded upon a careful practical investigation with reference to execution, in which I stated most distinctly I did not wish to be engaged. I presumed that if the Fine Arts Commissioners deemed those suggestions worthy of attention, they would refer them to the Commissioners of the bridge, by whom they would be duly considered, and, if approved, carried into effect by their own officers.

I now proceed to notice the several observations of Messrs. Walker and Burges upon the suggestions contained in my report. With reference to those upon the relative properties of circular and pointed arches, and to the authorities which they quote in depreciation of the pointed arch as applied to bridge-building, I beg to state, that the hypothesis in which those authorities are said to concur, namely, that a pointed arch requires a greater pressure [illegible] is at variance with the opinion of Professor Moseley, of King's College, one of the highest authorities in such matters, who, in a letter to me upon that subject, states, "that a pointed arch does not necessarily require a great pressure, or indeed any pressure, upon its crown, to prevent it from falling, and that the reasoning upon which an opposite conclusion is founded in Messrs. Walker and Burges's report is erroneous." But theory and practice confirm me in the opinion which I have advanced in my report, that a pointed arch requires less thickness at the crown than is usually considered necessary for a circular arch. As, however, it might possibly be inferred from the observations of Messrs. Walker and Burges that the arch which I have proposed is not strong enough for its purpose, although they do not attempt to prove that such is the case, I have thought it right to enter into a careful investigation of its properties; from which I am fully convinced that I have not carried the principle which I have advocated far enough; and that, considering the insignificant span of even the largest of the proposed arches, it would be no great effort of engineering science to reduce the thickness of its crown to nearly one-half of what is proposed by Messrs. Walker and Burges; by which means the lowering of the roadway over the centre arch might be carried to the extent of six feet six inches, instead of three feet six inches, even without reducing the clear height of the centre arch as I have proposed, if such reduction were deemed to be an objection of any importance. In this opinion I am confirmed by the examples of numerous stone bridges, both in this and other countries, and also by the judgment of several eminent engineers and mathematicians of the present day.

With reference to the loss of waterway which I stated was occasioned by the haunches or spandrils of the present arches at high-water, I ought perhaps to have explained that I referred to such portion only of the waterway as is affected by those obstructions, which might, however, I think, have been inferred. With regard to the removal of these obstructions, I do not agree with Messrs. Walker and Burges in thinking that it would be unproductive of any useful effect upon the "currents and falls;" and I consider the arguments in support of their opinion to be fallacious, inasmuch as they are founded upon the assumed level of high-water according to Trinity standard; whereas the present ordinary spring tides, as they must be well aware, rise considerably above that level; on one extraordinary occasion recently as much as 3 feet 6 inches. That some practical good would be effected in giving more head-room for craft near to the piers, by raising the springings of the arches according to my suggestion, Messrs. Walker and Burges admit; and I conceive that this advantage alone ought to be a sufficient inducement to remove the present arches and to substitute others of more convenient form; but when it is considered that the opportunity would be thereby afforded of lowering the roadway to nearly double the extent proposed by Messrs. Walker and Burges, without producing the slightest injury to the navigation of the river, the advantage as regards the convenience of the public is so much enhanced, that the propriety of re-building the superstructure cannot, I think, be doubted. With respect to my proposition of lowering the centre arch 18 inches, which it appears Messrs. Walker and Burges consider will be "rather a practical evil," as affecting the navigation of the river, it is necessary that I should call your attention to the clear height of the middle openings of some of the bridges above Westminster-bridge, as they have done to those only which are below that bridge. While the clear height of the centre arch of Westminster-bridge is 26 feet above Trinity standard of high-water, the centre openings of the modern bridges at Vauxhall and Hammersmith are of the respective heights of 25 feet 4 inches, and 16 feet 1 inch, to say nothing of those at Battersea and Putney-bridges, which are much less, but which I admit are extremely inconvenient. As the largest steamers which pass up the river are those which ply between London-bridge and Richmond, and as their funnels are jointed, so as to allow of their passing even under Putney-bridge, the height of the centre opening of which is only 11 feet [illegible] I cannot but think, I may be excused gined that the lowering of the centre arch of Westminster-bridge to the extent which I have proposed can really be an objection of any importance as regards the navigation of the river, while the great object that would be thereby gained by a further depression of the roadway, to the extent of 18 inches, reducing its inclination to 1 in 40, instead of 1 in 24, as proposed by Messrs. Walker and Burges, would be of the greatest advantage to the traffic over the bridge, as well as to the effect of the new Houses of Parliament when viewed from it; a point, which I submit, ought not to be disregarded.

Messrs. Walker and Burges state in their letter, as an objection to the form of arch which I have proposed, that the failure of one arch would cause the destruction of all the piers and arches; a consideration which they say is not to be disregarded in a bridge the piers of which have been so badly founded, that to support them has been a constant expense, and is at this moment a source of considerable anxiety; although they further state that the works they have in hand, if as successful as hitherto, will render the piers much more secure than they have ever been, they hope perfectly so. The part of this objection which is founded upon the lateral thrust of arches will apply with equal force to all arches of a segmental or elliptical form, which are generally adopted in modern bridges, and even to semicircular arches, of the lateral thrust of which I will not affect to suppose Messrs. Walker and Burges to be ignorant, although in the allusion which they make to Labelye's opinion upon that subject, they leave it to be so inferred. With regard to the other part of the objection—namely, the failure of the foundations, it may surely be assumed that Messrs. Walker and Burges would not have recommended the very serious outlay which is now being incurred in securing them, if they conceived there was any risk whatever of their ultimate failure; but if a possible failure is, notwithstanding, to be taken into consideration, can a more powerful argument be advanced in favour of a new superstructure than that the weight upon the piers might thereby be reduced at least one-third?

To Messrs. Walker and Burges's design for a new superstructure I object, principally because it does not accomplish the main object for which a new superstructure is, in my opinion, desirable, namely, the reduction of the mass of the bridge and the lowering of the roadway to the utmost practicable extent; neither does it afford any improvement whatever in respect of the navigation of the river; the accomplishment of which object is, in my opinion, of far greater importance, both for the sake of public convenience and architectural effect, than the style of architecture to be adopted.

As to the principles which Messrs. Walker and Burges consider should govern the nature of a design for a bridge over the Thames in London, I entirely disagree with them. I conceive that the height of the opposite shores and buildings upon them should mainly determine the æsthetical character of the design. If, as in Waterloo-bridge, where the shores are high, one being naturally so, and the other raised, and the roadway is level, where the superstructure of a great public building like Somerset-house is wholly above the level of the roadway, and where the bridge groups with the substructure of such an important building, the character of the design cannot be too bold and massive; but if, as at Westminster, where the shores are low, and the bridge must in consequence group with the superstructure of an extensive work like that of the new Houses of Parliament, and where the parapet must, in consequence of the height required for the centre arch, assume a curve line, which is an element rather of elegance than of boldness, the character of the bridge should be light and graceful.

Upon the taste of Messrs. Walker and Burges's design for a new superstructure in what they term the "Norman style," I forbear to offer any criticisms in detail, as the conditions which should be observed in a bridge are, in my opinion, wholly at variance with the essential characteristics of that style; nor do I consider it worth while to make any remarks upon their observations relative to points of taste, including those especially which refer [illegible] between the bridge